Artificial Intelligence

Artificial Intelligence refers to a science where a non-natural element can be made intelligent. In simpler terms, an artificial object, man-made object can understand and think on its own.

Machine Learning

Machine learning refers to ways by which a machine can learn without being programmed. In simple terms, machine learning is data driven application which can make its own decision based on varying inputs and can improve its decisions over time.

Beneficial Machines.

It is Impossible to anticipate all how a machine Pursuing a fixed objective might misbehave there is a good reason then to think that the standard model is inadequate we don't want them to Pursue our objectives. If we Cannot Transfer those objectives Perfectly to the machine then we need a new formulation one in which the machine is Pursuing our objectives but is necessarily uncertain as to what they are when a machine knows that it doesn't know the Complete objective It has an incentive to act Cautiously to ask Permission to learn more about our Preferences through observation and to defer to human control. Ultimately we want agents that are Provably beneficial To humans

① Computer vision and speech recognition to perceive the world
② robotics to manipulate objects and move about.

The six disciplines compose most of AI

Thinking humanly

To say that a program thinks like a human, we must know how humans think. We can learn about human thought in three ways:
① Introspection: trying to catch our thoughts as they go by.

② Psychological experiments - observing a person in action.

③ brain Imaging observing the brain in action.

once we have a sufficiently precise theory of the mind, it becomes possible to express the theory as a computer program. If the program's input-output behavior matches corresponding human behavior

That is evidence that some of the Programs mechanisms Could also be operating inhumans.

Thinking rationally the laws of thought approach

The Greek Philosopher aristotle was one of the first to attempet to Codify

"right thinking" That is Irrefutable reasoning processes. His syllogisms provided patterns for argument structures that always yielded correct conclusions when given correct premises. the canonical example starts with socrates being a man and all man are ~~human~~ mortal and conclude that socrates is mortal. these laws of thought were supposed to govern the operation of the mind their study initiated the field called Logic

Logicians developed a precise nation for statements about objects in the world and relation among them. (Compare this with ordinary arthimetic nation which only provides statments about numbers) the Program Can in Principle solve any solvable problem described in Logical

notion. Logic requires knowing the world with certainty a condition that is rarely met In fact Probability theory fills this gap allowing accurate reasoning with uncertain information allowing the construction of a comprehensive model of rational thinking Leading from raw perceptual information on understanding how the world works to predictions what it does not do is generate intelligent behavior for that we need a theory of rational action Rational thought by itself is not enough.

Acting rationally

an agent is just something that acts. of course all computer programing do somthing but computer agents are expected to do more: operate autonomously, perceive their environment persist over a prolonged period adapt to change and create and pursue goals a rational agent acts to achive the best out come or when there is uncertainty the best expected out come
in a nutshell, AI has focused on the study and construction of agents that do the right thing.

the four approaches in more detail.

The Turing test was designed by alan turing (1950)

as though experiment that would avoid the philosophical ambiguity of the question Can a machine Think so that a Computer would Pass the test if a human Investigator Could not tell whether written responses were Coming From a person or a Computer after asking some written questions. Currently, we note that Programming a Computer to Pass a rigorously applied test offers a lot to work on. the Computer will need the Following Capabilities:

① natural language processing to Communicate Successfully in a human language.
② knowledge representation to store what it knows or hears
③ automated reasoning to answer questions and to draw new Conclusions.
④ machine learning to adapt to new circumstances and to detect and extrapolate Patterns

the Turing test Considers that physical simulation of a human being is not necessary to prove intelligence, but it requires Interaction with things and People in the real world and requires the robot to Pass this test.

What is artificial Intelligence?

To get to the right definition, researchers divided them into two parts interms of difination.

① Some Consider Intelligence to be a property of Internal thought Processes and reasoning

② while other focus on Intelligent behavior an external characterization

From this we have two dimensions:
number ① human vs rational
number ② Thought vs behavior
There have been adherents and research programs for all four point.

The methods used are necessarily different

The pursuit of human Like Intelligence must be in part an empirical science related to psychology, involving observations and hypotheses about actual human behavior and thought processes; a rationalist approach, on the other hand, involves a Combination of mathimatics the various groups have both disparaged and helped each other. Let us Look at